

Volcanic Ash Nephelometer Probe, Phase II

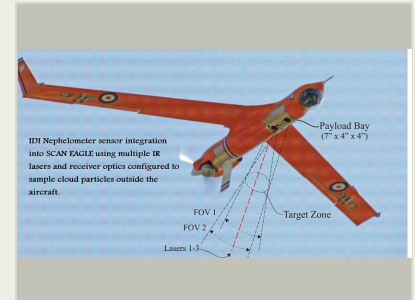
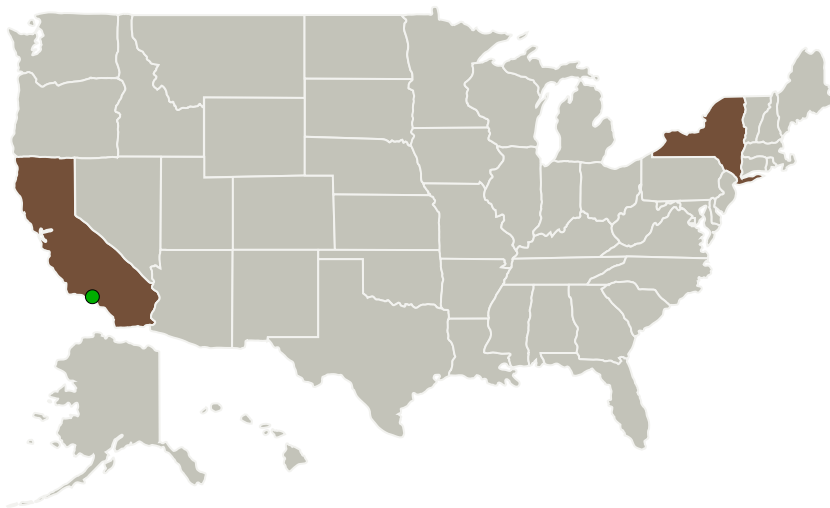
Completed Technology Project (2012 - 2014)



Project Introduction

Advanced dropsondes that could effectively be guided through atmospheric regions of interest such as volcanic plumes may enable unprecedented observations of important atmospheric phenomena. IDI proposes to develop a flight ready optical sensor to provide cloud properties and hazardous volcanic ash and icing information within commercial airspace. The probe will initially be developed for a dropsonde but eventually be integrated into the unmanned SCAN EAGLE UAV. The innovation is a new capability for making in-situ measurement of cloud particulates to improve pilot awareness of hazardous operating conditions, such as those recently experienced by aircraft engines operating near volcanic plumes in the North Atlantic near Iceland. . During a Phase I program IDI developed a miniature Nephelometer sensor prototype and demonstrated the ability to measure small ash and water particulates as well as provide discrimination between them. Phase II will integrate the Nephelometer and a commercial SO2 sensor into a radiosonde package for a tethered field test at the NASA Wallops test facility and finally deployed near an active volcano in central America. The probe packaging will designed such that it is upwardly compatible in size and weight with the SCAN EAGLE UAV payload as well as other payload recovery vehicles.

Primary U.S. Work Locations and Key Partners



Volcanic Ash Nephelometer Probe

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| Organizations Performing Work | Role | Type | Location |
|----------------------------------|-------------------------|-------------|----------------------|
| Innovative Dynamics, Inc. | Lead Organization | Industry | Ithaca, New York |
| ● Jet Propulsion Laboratory(JPL) | Supporting Organization | NASA Center | Pasadena, California |

| Primary U.S. Work Locations | |
|-----------------------------|----------|
| California | New York |

Project Transitions

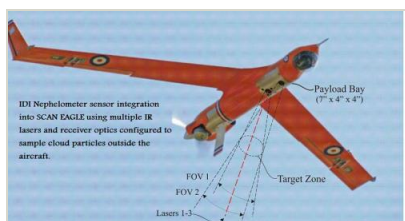
▶ **April 2012:** Project Start

✓ **April 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138565>)

Images



Project Image

Volcanic Ash Nephelometer Probe
(<https://techport.nasa.gov/image/135520>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Innovative Dynamics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

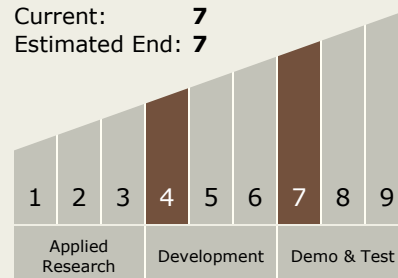
Carlos Torrez

Principal Investigator:

Jack Edmonds

Technology Maturity (TRL)

Start: 4
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System